Service Manual

STEREO AMPLIFIER

SA-610

PIONEER®

- **This service manual is applicable to the KU type.**

CONTENTS

1. SPECIFICATIONS 3
2. FRONT PANEL FACILITIES 4
3. DISASSEMBLY 6
4. PARTS LOCATION 6
5. BLOCK DIAGRAM 8
6. LEVEL DIAGRAM 8
7. CIRCUIT DESCRIPTIONS 9
8. ADJUSTMENTS 10
9. EXPLODED VIEWS AND PARTS LIST 11
10. SCHEMATIC DIAGRAM, P.C. BOARD PATTERNS AND PARTS LIST
    - 10.1 Miscellanea 14
    - 10.2 Schematic Diagram 15
    - 10.3 P.C. Board Connection Diagram 18
    - 10.4 Parts List of P.C. Board Assembly 21
11. PACKING 22

1. SPECIFICATIONS

Semiconductors

ICs 3
Transistors 27
Diodes 18

Amplifier Section

Continuous power output of 45watts* per channel, min., at 8ohms from 20Hertz to 20,000 Hertz with no more than 0.03% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms, from AUX)
22.5 watts per channel power output
. . . . . No more than 0.02%
Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4 : 1 8 ohms, from AUX)
continuous rated power output . . No more than 0.03%
22.5 watts per channel power output
. . . . . No more than 0.02%
Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms) . . 50
Input (Sensitivity/Impedance)
PHONO . . . . . 2.5mV/50 kilohms
TUNER . . . . . 150mV/50 kilohms
AUX . . . . . 150mV/50 kilohms
TAPE PLAY 1, 2 . . . . . 150mV/50 kilohms
Phono Overload Level (T.H.D. 0.05%, 1,000Hz)
PHONO 130mV
Output (Level)
TAPE REC 1, 2 . . . . . 150mV
Speaker . . . . . A, B, OFF

Frequency Response
PHONO (RIAA Equalization)
. . . . . 20Hz to 20,000Hz ±0.3dB
TUNER, AUX, TAPE PLAY 1, 2
. . . . . 10Hz to 60,000Hz ±3dB
Tone Control
BASS . . . . . ±10dB (100Hz)
TREBLE . . . . . ±10dB (10,000Hz)
Subsonic Filter . . . . . 15Hz (−6dB/oct)
Loudness Contour (Volume control set at −40dB position)
. . . . +6dB (100Hz), +3dB (10,000Hz)
Hum and Noise (IHF, short-circuited, A network)
PHONO 82dB
TUNER, AUX, TAPE PLAY 1, 2 . . . . . 100dB

Miscellaneous

Power Requirements . . . . . AC 120V, 60Hz
Power Consumption . . . . . 100W (UL)
Dimensions . . . . . 420(W) x 94(H) x 347(D) mm
16-9/16(W) x 3-11/16(H) x 13-11/16(D) in
Weight (without package) . . . . . 6.9kg (15 lb 3oz)

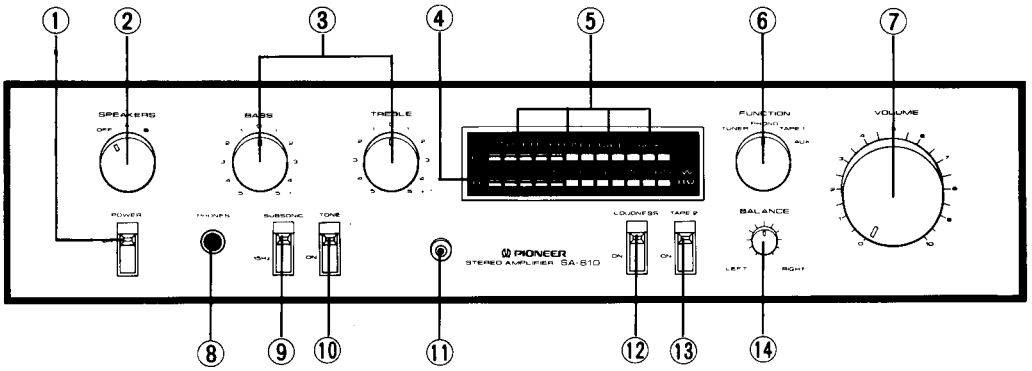
Furnished Parts

Operating Instructions 1

NOTE:
Specifications and the design subject to possible modifications without notice due to improvements.

* *Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.*

2. FRONT PANEL FACILITIES



① POWER SWITCH

Set this switch to ON to supply power to the amplifier. There will be a short delay when it is set to ON, because the muting circuit has been actuated to suppress the unpleasant noise that is sometimes generated when the power is on and off.

② SPEAKER SELECTOR

Use this selector to select the speaker system.

OFF: Sound not obtained from speakers.

A: Sound obtained from speakers connected to the A speaker terminals.

B: Sound obtained from speakers connected to the B speaker terminals.

③ BASS AND TREBLE CONTROLS

Use these controls to adjust the bass and the treble. If you set the tone switch to ON and turn the bass control to right from its center position, you will be able to emphasize the sound in the low-frequency range. Conversely, turning the bass control to the left from the center position, you will attenuate the sound.

You can use the treble control to adjust the sound in the high-frequency range.

④ POWER METER

This meter allows you to read out the rated power level on the fluorescent display tube when speakers with a nominal impedance of 8 ohms are connected to the amplifier's speaker terminals.

⑤ FUNCTION INDICATORS

The TUNER, PHONO, TAPE, AUX function indicators light up in accordance with the position of the function selector.

⑥ FUNCTION SELECTOR

Use this selector to select the program source. When set, the function indicator above the meter panel corresponding to the position of the function selector will light up.

TUNER: Set here when listening to broadcasts on a tuner connected to the TUNER jacks.
(The TUNER function indicator lights up.)

PHONO: Set here when playing records on a turntable connected to the PHONO jacks.
(The PHONO function indicator lights up.)

TAPE 1: Set here when playing tapes on the tape deck connected to the TAPE 1 jacks.
(The TAPE function indicator lights up.)

AUX: Set here when listening to a program source which is connected to the AUX jacks.
(The AUX function indicator lights up.)

⑦ VOLUME CONTROL

Use this control to adjust the output level to the speakers and headphones. Turn it clockwise to increase the output level. No sound will be heard if you set it to "0."

⑧ HEADPHONE JACK

Plug the headphones into this jack when you want to listen through your stereo headphones.

NOTE:
Set the speaker selector to OFF when listening only with headphones.

⑨ SUBSONIC FILTER SWITCH

When this switch is set to the 15Hz position, the subsonic filter with a cut-off frequency of 15Hz is actuated. The subsonic filter serves to attenuate frequencies lower than 15Hz in a 6dB/oct slope. It is therefore effective in suppressing ultra-low-frequency noise which is generated by record warp and other causes. You cannot actually hear this noise but it is a factor in the generation of intermodulation distortion and it may damage your speaker system. Set this switch to the 15Hz position during record play for the best effect.

⑩ TONE SWITCH

Set this switch to ON when adjusting the bass and treble controls. When set to the upper (OFF) position, the tone control circuits are disengaged and frequency response is flat. This function is convenient for checking phono cartridge and speaker tone quality and listening room acoustics.

⑪ POWER INDICATOR

When the power switch is set to ON this lamp lights up, indicating the amplifier is turned on.

⑫ LOUDNESS SWITCH

When listening to a performance with the volume control turned down, set this switch to ON and the bass and treble will be accentuated.
When the volume is low, the human ear finds it harder to hear the bass and treble than when the volume is high. The loudness switch is thus designed to compensate for this deficiency. By setting it to ON, the bass and treble come through much more strongly and the sound takes on a punch even when the volume control is turned down.

⑬ TAPE 2 SWITCH

Set this switch to the ON position when monitoring a tape performance on a tape deck which you have connected to the TAPE 2 jacks or when monitoring a recording.

NOTE:
Set the switch to the upper (OFF) position when listening to records or broadcasts, etc. selected by the function selector.

⑭ BALANCE CONTROL

Use this control to balance the volume of the left and right channels. If the sound appears to be louder on the right, it means that the volume of the right channel is higher. Turn the balance control to the left and adjust.
Conversely, if the sound appears to be louder on the left, it means that the volume of the left channel is higher. Therefore, turn the balance control to the right and adjust.

3. DISASSEMBLY

Bonnet Case

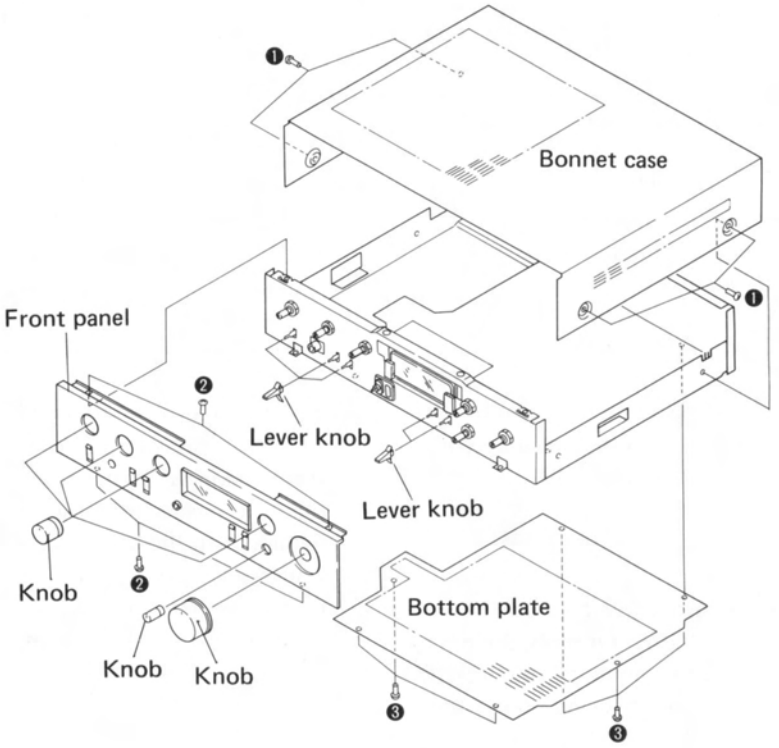
Remove the four screws ❶.

Front Panel

Remove the four screws ❷.

Bottom Plate

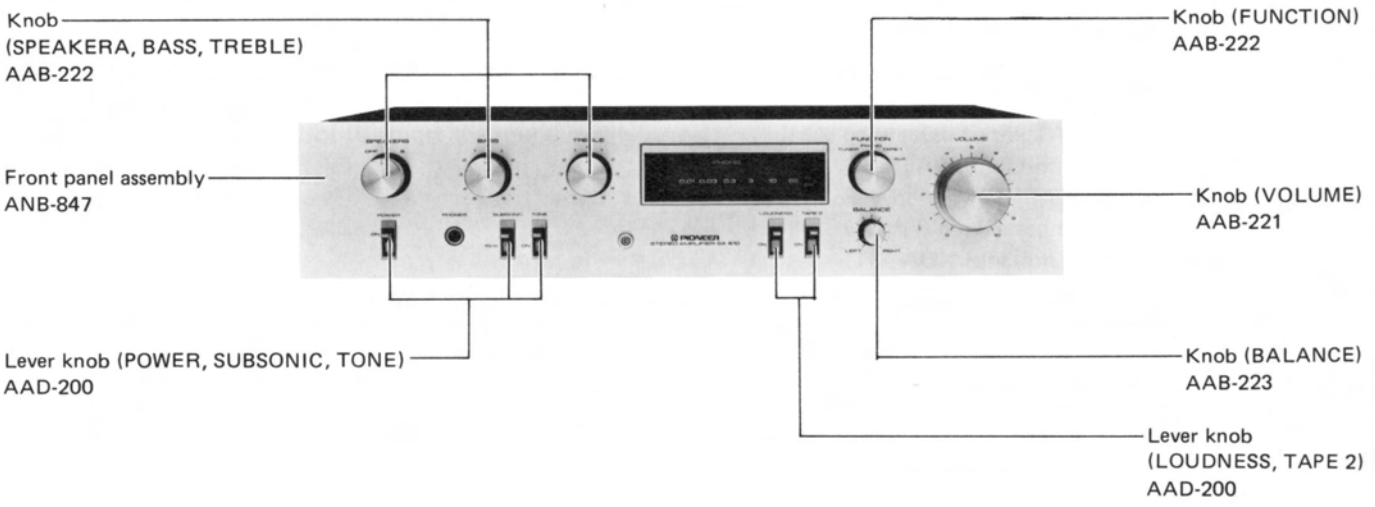
Remove the six screws ❸.



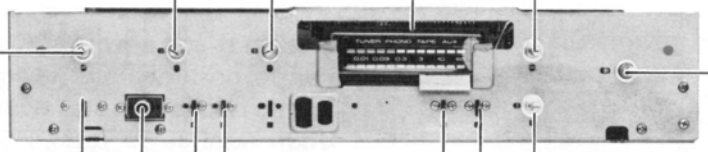
4. PARTS LOCATION

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Front Panel View



Front View with Front Panel Removed



Fluorescent indicator tube
AAV-006

Variable resistor (BASS, TREBLE)
ACT-127

Slide rotary switch
(FUNCTION)
ASX-113

Slide rotary switch
(SPEAKERS)
ASE-003

Variable resistor (VOLUME)
ACV-184

⚠ Lever switch (POWER)
ASK-520

Variable resistor (BALANCE)
ACT-130

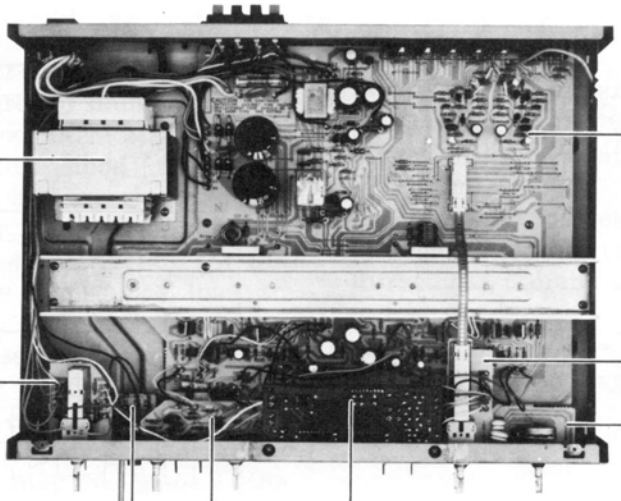
Headphones jack
AKN-023

Lever switch (TAPE 2)
ASK-172

Lever switch (SUBSONIC, TONE)
ASK-171

Lever switch (LOUDNESS)
ASK-171

Top View with Bonnet Removed



⚠ Power transformer
ATT-667

AF amplifier assembly
GWK-144

Switch assembly
GWS-215

Switch assembly
GWS-216

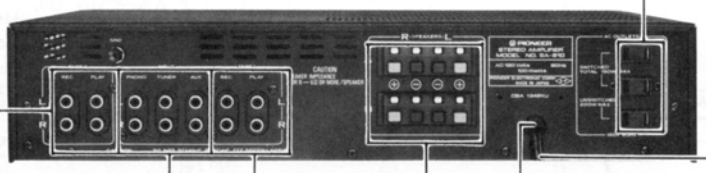
Volume assembly
GWX-459

Headphones assembly
GWX-460

F.L. assembly
AWV-007

Tone control assembly
GWG-138

Rear Panel View



⚠ AC socket
AKP-032

Terminal
(TAPE 2)
AKB-063

⚠ Power code
ADG-023

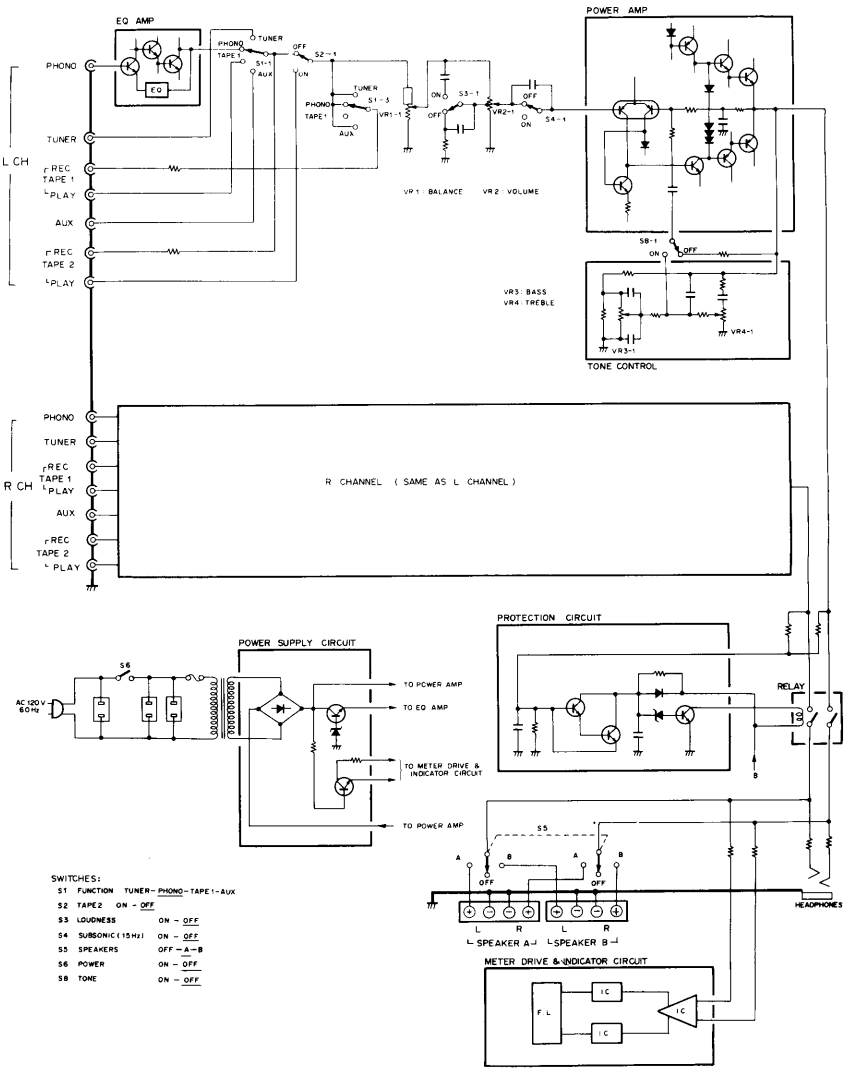
Terminal (INPUT)
AKB-064

Strein relief
AEC-327

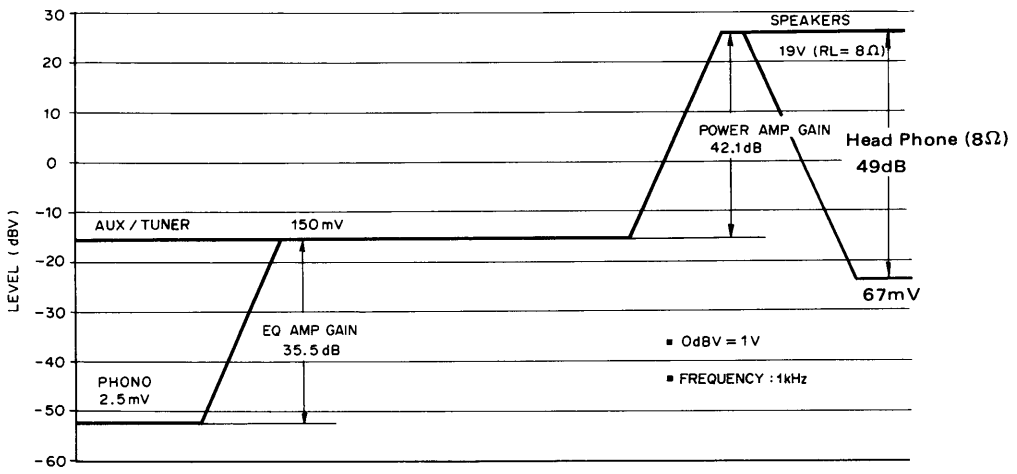
Terminal (TAPE 1)
AKB-063

Terminal (SPEAKERS)
AKE-051

5. BLOCK DIAGRAM



6. LEVEL DIAGRAM



7. CIRCUIT DESCRIPTIONS

Equalizer Amplifier

The SA-610 features a 3-stage direct-coupled equalizer amplifier for greater reduction of noise and distortion.

Besides the use of an ultra low-noise transistor (2SC2602) in the first stage, the adoption of low impedance input resistance and equalizer circuit has contributed to an S/N ratio of at least 82dB (at 2.5mV input, IHF-A).

Power Amplifier

This all stage direct-coupled pure complementaly SEPP circuit features a current mirror load differential amplifier in the first stage, and incorporates the tone control circuit in the NFB loop.

Although the incorporation of the tone control circuits in the power amplifier stage reduces the number of elements that the signal has to pass through, and thereby further reduces noise, distortion, and cost, the power stage does require a higher gain and a higher degree of stability. In the SA-610, this high gain and high stability are achieved by a current mirror load differential amplifier in the first stage and by the use of a constant current circuit for the load of the pre-driver stage. Furthermore, the tendency for the pre-driver stage capacitance impedance load to cause deterioration in the high end frequency response is suppressed by inserting a capacitor (C) between the emitter of the pre-driver stage (Q2) and the base of the constant current circuit (Q1) as shown in Fig. 7-1. At frequencies where the reactance of this capacitor may be ignored, the push-pull action of Q1 and Q2 serves to counteract the high end frequency response deterioration.

The power amplifier stage is a complementary 2-stage Darlington connection, resulting in an output power rating of 45W + 45W (8Ω, 20Hz–20kHz), harmonic distortion of less than 0.03% (20Hz – 20kHz at rated output), and output power bandwidth of 5Hz — 50kHz (0.03% THD). Certainly a superb performance for an amplifier of this class is obtained.

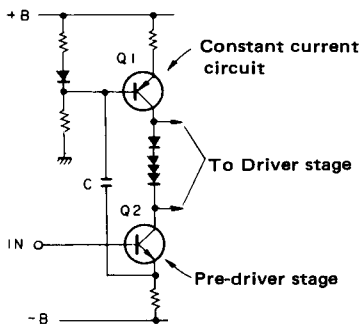


Fig. 7-1 Pre-driver stage

Protection Circuit

Besides protecting the speakers if a DC voltage should happen to appear at the power amplifier stage outputs, this circuit also mutes the signal path when the power switch is turned on and off (See Fig. 7-2).

If for any reason a DC voltage (in excess of about ±5V) should happen to appear in the output of the power amplifier stage, it is detected immediately by either Q23 or Q24. Q23 is turned on by a positive voltage, and Q24 by a negative voltage. In either case, Q25 is also turned off, thereby opening the relay contact to disconnect the power amplifier stage from the speakers.

The muting action when the power switch is turned on is achieved by delaying the rise of the Q25 base potential by means of the R95/C77 time constant circuit. When the power switch is turned on, C77 is charged up via R95, thereby increasing the voltage across both ends of this capacitor. When this voltage exceeds the zener voltage of the D15 zener diode, Q25 is biased in the forward direction, and is thereby turned on to close the relay contact.

When the power switch is turned off, C77 discharges rapidly via D18, resulting in Q25 being turned off, thereby opening the relay contact.

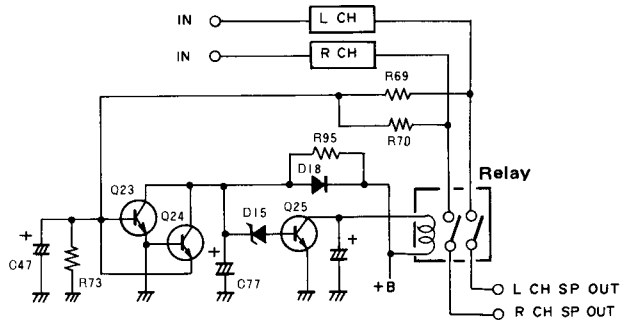


Fig. 7-2 Protection circuit

8. ADJUSTMENTS

8.1 IDLE CURRENT ADJUSTMENT

1. Set the SPEAKERS selector to the A position, and connect an 8Ω resistor to the speaker output terminals.
2. Turn the VOLUME control down to minimum level, turn the power on, and wait about 10 minutes.
3. Connect a DC voltmeter to the TP terminals (Lch; TP4 and TP3, Rch; TP2 and TP1) of the AF Amplifier Assembly (GWK-144).
4. Check that the voltage between TP4 and TP3 (Lch) lies within the DC 4mV-50mV range then make a similar check for the Rch (between TP2 and TP1). If the voltage is less than 4mV, cut jumper wire A (Lch), and jumper wire B (Rch). If the voltage exceeds 70mV, check for circuit failure.

8.2 OUTPUT INDICATOR ADJUSTMENT

1. Set the TONE CONTROL to the center position.
2. Set the SPEAKERS selector to the A position, and connect an 8Ω resistor and AC voltmeter to the speaker output terminals.
3. Set the FUNCTION switch to the AUX position, and apply a 1kHz, 150mV signal to the AUX terminals.
4. Adjust the VOLUME control so that the voltage on the output terminals (SPEAKERS) read 9V (AC).
5. Adjust VR1 (Lch) and VR2 (Rch) of the indicator assembly so that the output power indicator read 10 watts.

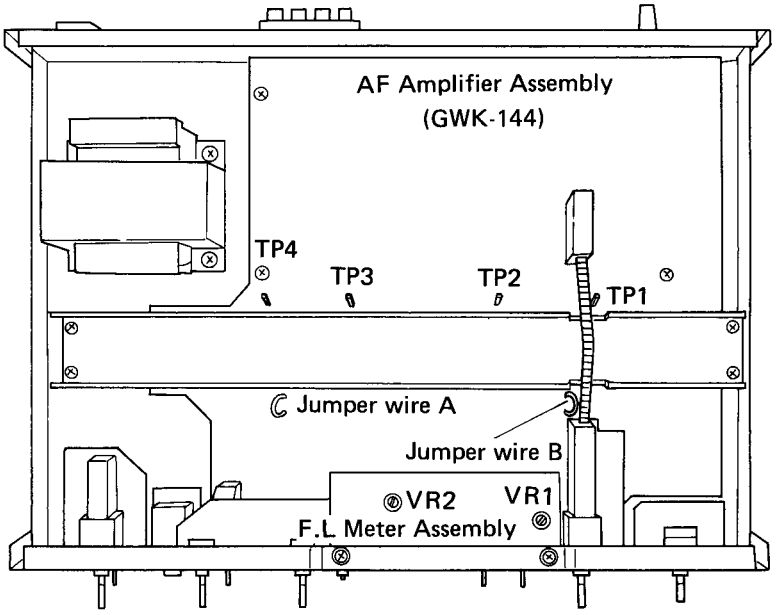
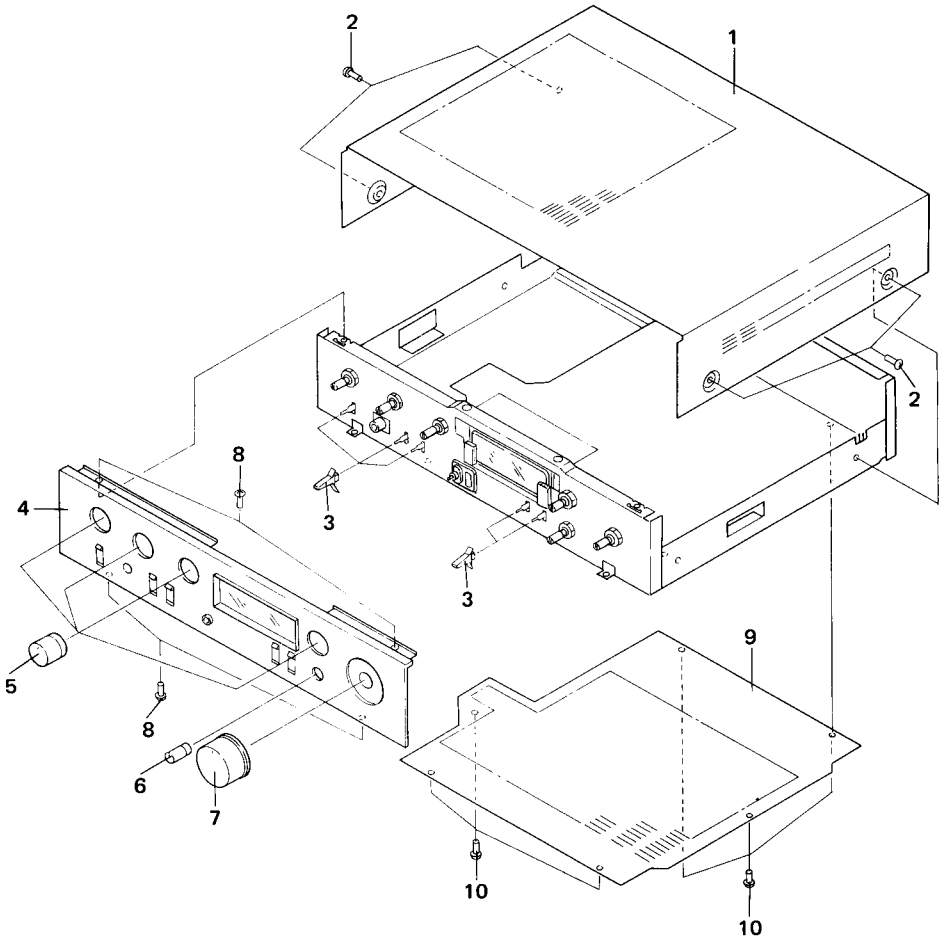


Fig. 8-1 Adjustment point

9. EXPLODED VIEWS AND PARTS LIST

Exterior Component



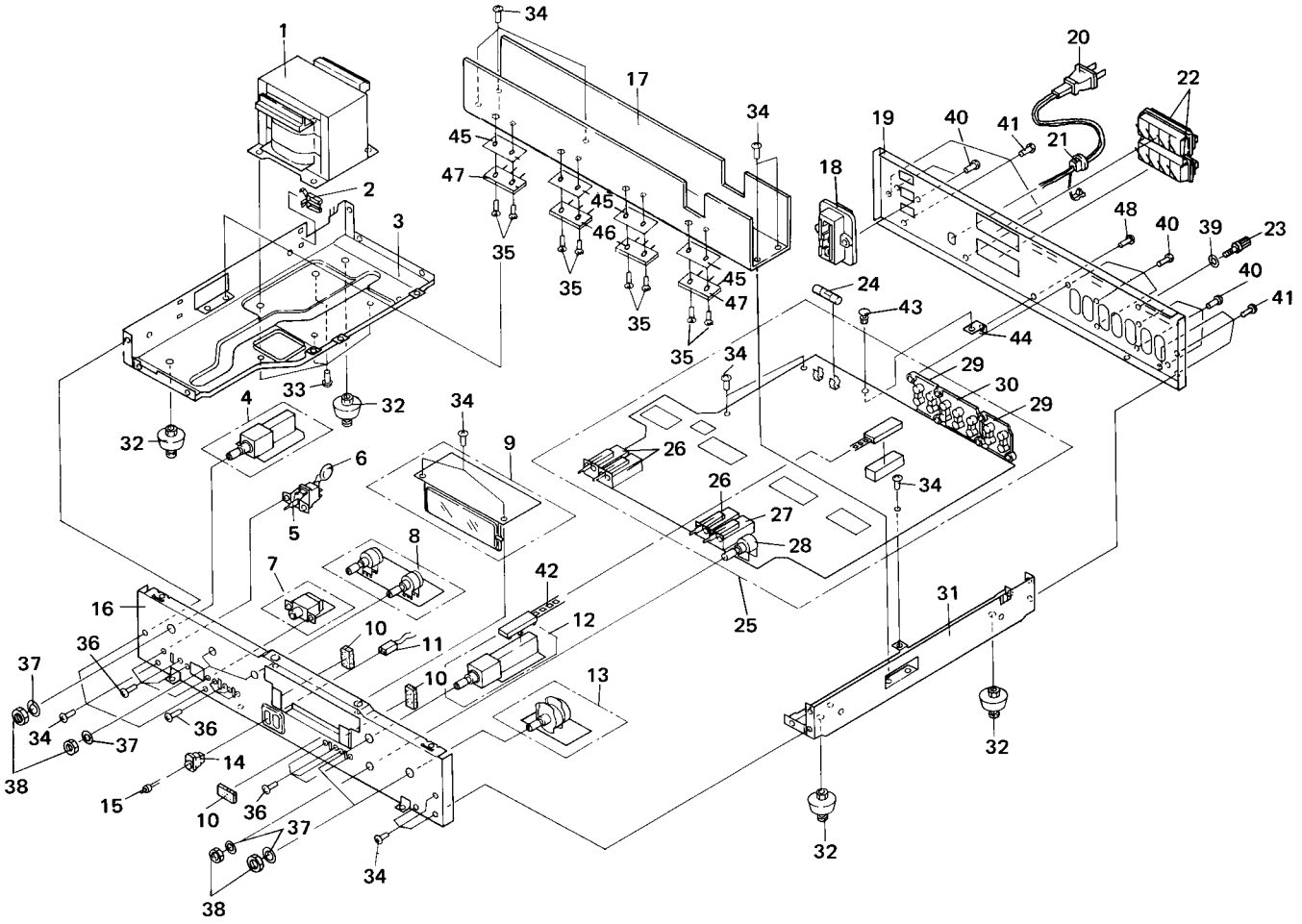
Parts List

NOTE:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Key No.	Part No.	Description
1.	ANE-269	Bonnet case
2.	ABA-079	Screw
3.	AAD-200	Lever knob
4.	ANB-847	Front panel assembly
5.	AAB-222	Knob
6.	AAB-223	Knob
7.	AAB-221	Knob
8.	ABA-186	Screw
9.		Bottom plate
10.	ABA-066	Screw

Interior Component



Parts List

Key No.	Part No.	Description
⚠ 1.	ATT-667	Power transformer
2.		Wire clip
3.		Frame
4.	GWS-215	Switch assembly
⚠ 5.	ASK-520	Lever switch
⚠ 6.	ACG-001	Capacitor
7.	GWX-460	Headphones assembly
8.	GWG-138	Tone control assembly
9.	AWV-007	F.L. assembly
10.		Cushion
11.		LED socket
12.	GWS-216	Switch assembly
13.	GWX-459	Volume assembly
14.		Cushion rubber
15.	AEL-320	LED
16.		Panel stay
17.		Heat sink
⚠ 18.	AKP-032	AC socket
19.		Rear panel
⚠ 20.	ADG-023	Power code
21.	AEC-327	Strein relief
22.	AKE-051	Terminal
23.		Terminal (GND)
⚠ 24.	AEK-100	Fuse
25.	GWK-144	AF amplifier assembly
26.	ASK-171	Lever switch
27.	ASK-172	Lever switch
28.	ACT-130	Variable resistor
29.	AKB-063	Terminal
30.	AKB-064	Terminal
31.		Frame
32.	AEC-672	Foot assembly
33.	ABA-107	Screw
34.	ABA-066	Screw
35.	ABA-234	Screw
36.	ABA-026	Screw
37.	M45-086	1t spacer
38.	B71-004	Nut 9ϕ
39.	ABE-005	Washer
40.	ABA-240	Screw
41.	ABA-198	Screw
42.		Remote wire
43.	AEC-352	Nylon rivet
44.		P.C.B. holder
45.	AEC-488	Insulator spacer
46.	2SA1108/A/Q or R	Transistor } hfe should have the
47.	2SC2588/A/Q or R	Transistor } same rank
48.	ABA-145	Screw

10. SCHEMATIC DIAGRAM,P.C.BOARD PATTERNS AND PARTS LIST

10.1 MISCELLANEA

NOTE:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω——56 x10¹——561 . . . . . RD¼PS 5 6 1 J
47kΩ——47 x10³——473 . . . . . RD¼PS 4 7 3 J
0.5Ω——0R5 . . . . . RN2H 0 R 5 K
1Ω——010 . . . . . RS1P 0 1 0 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 x 10¹ 5621 . . . . . RN¼SR 5 6 2 1 F

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Miscellaneous Parts

ASSEMBLIES

Part No.	Symbol & Description
GWK-144	AF amplifier assembly
GWG-138	Tone control assembly
GWS-215	Switch assembly
GWS-216	Switch assembly
GWX-459	Volume assembly
GWX-460	Headphones assembly
AWV-007	F.L. assembly

SEMICONDUCTORS

Part No.	Symbol & Description	
2SA1108/A/Q or R	Q21, Q22	hfe should have the same rank
2SC2588/A/Q or R	Q19, Q20	
AEL-320	D1 LED	

CAPACITOR

Part No.	Symbol & Description		
⚠ ACG-001	C1	Capacitor	0.01/250V

OTHERS

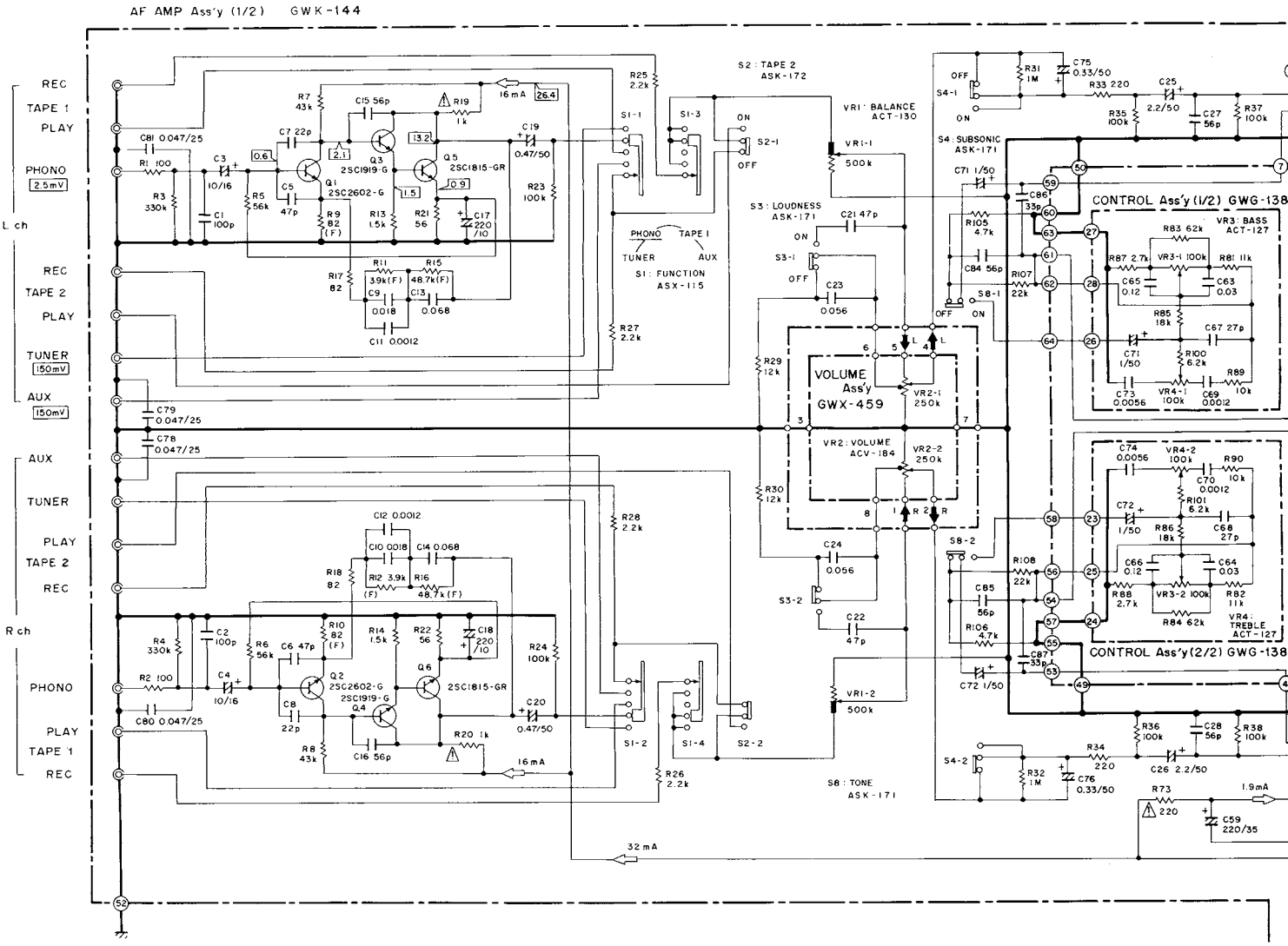
Part No.	Symbol & Description	
⚠ ATT-667	T1	Power transformer
⚠ AEK-100	F1	Fuse
ASK-520	S8	Lever switch (POWER)
⚠ AKP-032		AC socket
⚠ ADG-023		Power code
ANB-847		Front panel assembly
AKE-051		Terminal (SPEAKERS)

List of Changed Parts for Factory Modification

List of changed parts information will be furnished whenever necessary and you are requested to amend parts number in this parts list.

Symbol	Part No.	Description

10.2 SCHEMATIC DIAGRAM



1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ± 10% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
V : Signal voltage at 45 W + 45 W 8Ω output (1kHz)
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
⇦ mA : DC current at no input signal

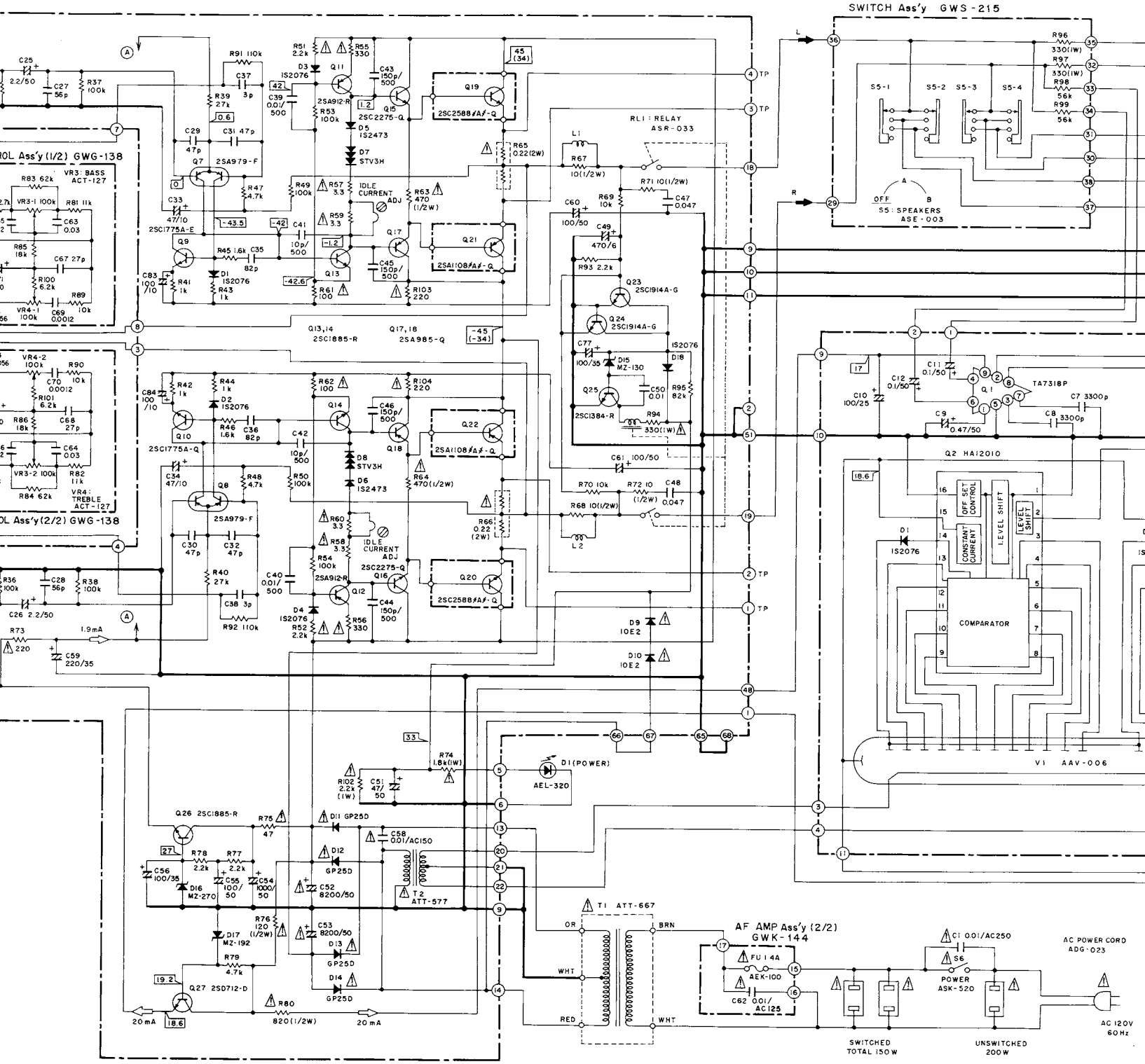
4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

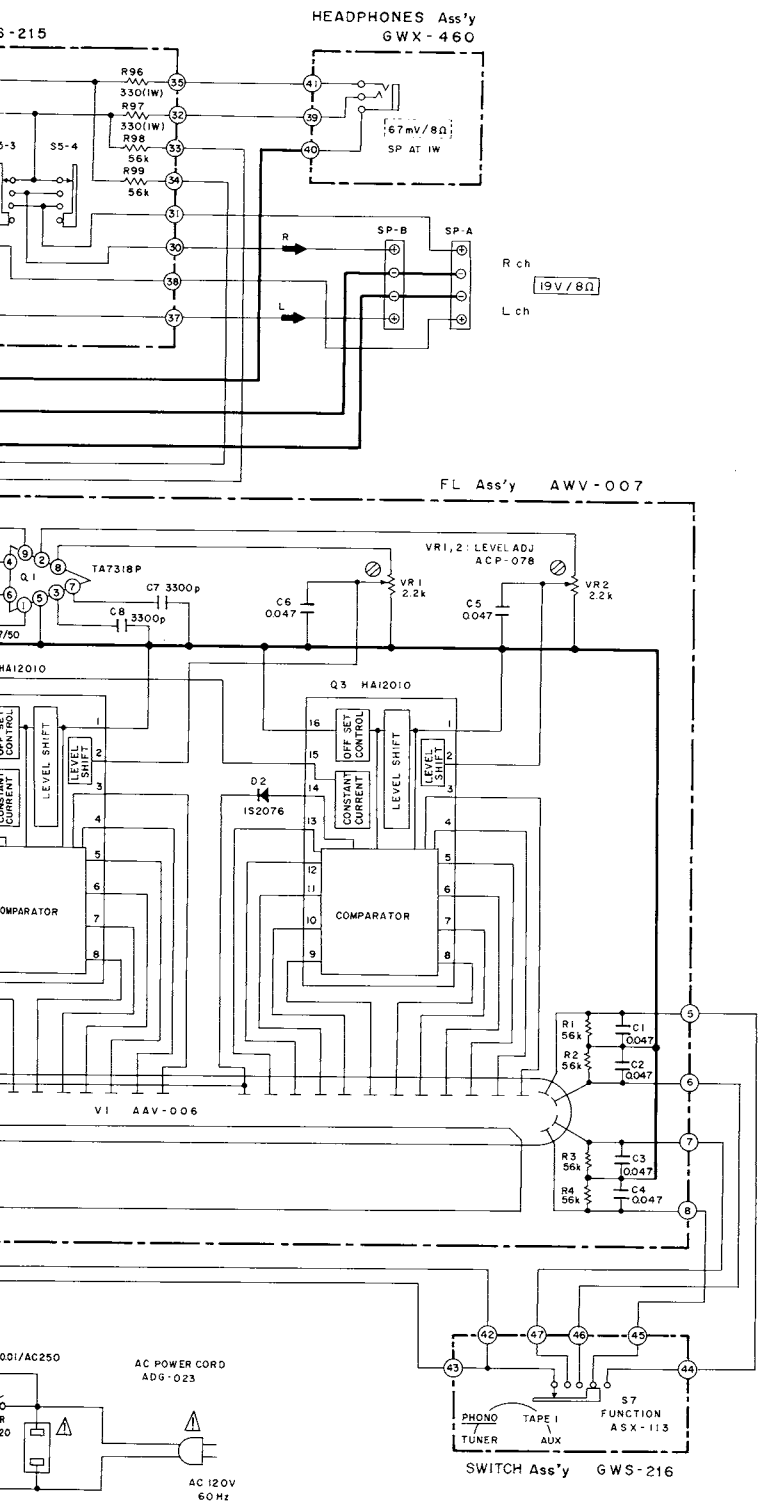
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

S1,7 : FUNCTION	TUNER — PHONO — TAPE 1 — AUX
S2 : TAPE 2	ON — OFF
S3 : LOUDNESS	ON — OFF
S4 : SUBSONIC (15Hz)	ON — OFF
S5 : SPEAKERS	OFF — A — B
S6 : POWER	ON — OFF
S8 : TONE	ON — OFF

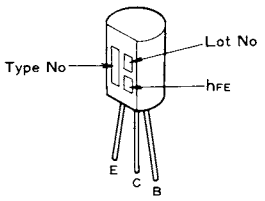
The underlined indicates the switch position.


SWITCH Ass'y GWS-215
S5-1
S5-2
S5-3
S5-4
OFF
S5: SPEAKERS
ASE-003
RL1: RELAY
ASR-033
Q13,14
2SC1885-R
Q17,18
2SA985-Q
2SC1775A-E
2SC1775A-Q
2SA979-F
2SC1914A-G
2SC1384-R
2SA1108/A-Q
2SC2588/A-Q
2SC2275-Q
2SA912-R
IS2076
STV3H
IS2473
MZ-130
MZ-270
MZ-192
GP25D
AEL-320
TA7318P
HA12010
AAV-006
COMPARATOR
OFF SET CONTROL
CONSTANT CURRENT
LEVEL SHIFT
IDLE CURRENT ADJ
VR3: BASS ACT-127
VR4: TREBLE ACT-127
VR4-2 100k
VR3-2 100k
VR4-1 100k
VR3-1 100k
Q26 2SC1885-R
Q27 2SD712-D
T1 ATT-667
T2 ATT-577
AF AMP Ass'y (2/2) GWK-144
FU1 4A
AEK-100
POWER ASK-520
AC POWER CORD ADG-023
AC 120V 60Hz
SWITCHED TOTAL 150W
UNSWITCHED 200W
1.9mA
20mA
820(1/2W)
OR
BRN
WHT
RED



Appearance of Transistors and ICs

2SA912
2SC1885



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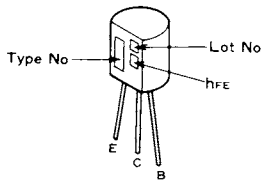
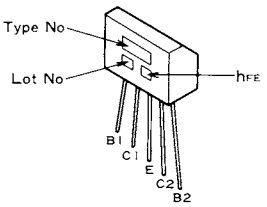
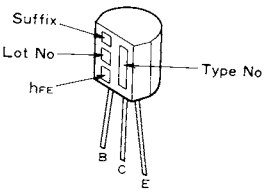


2SA979



2SC1914A



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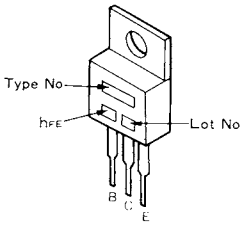
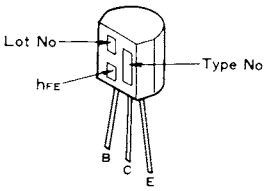


2SC1919
2SC2602



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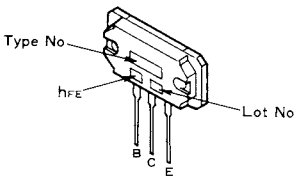

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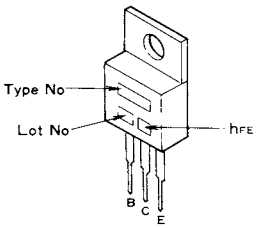

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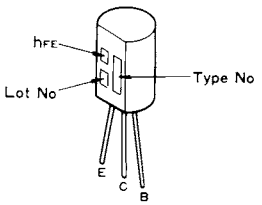
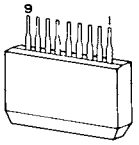
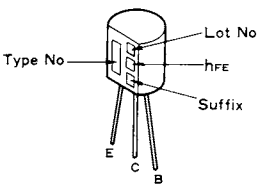


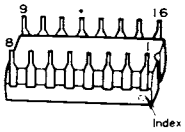
TA7318P



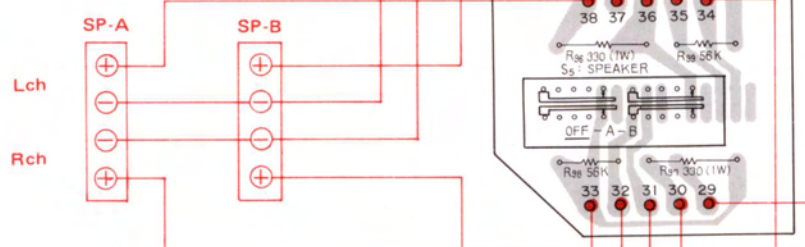
2SC1775A



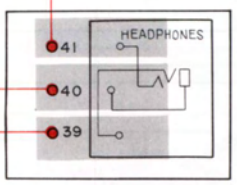
HA12010



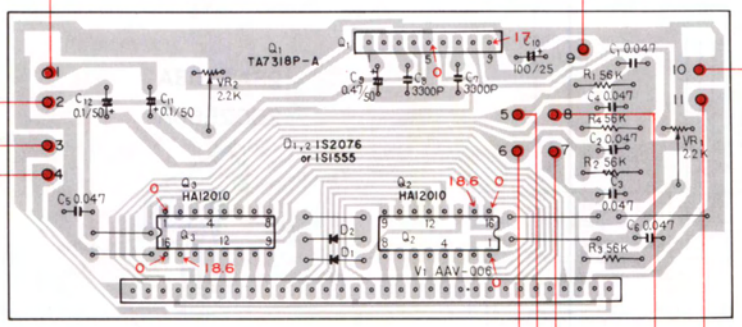
10.3 P.C. BOARD CONNECTION DIAGRAM



SWITCH Ass'y
(GWS-215)

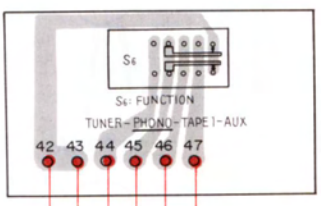


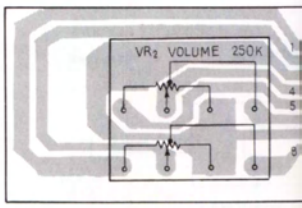
HEADPHONE Ass'y
(GWX-460)



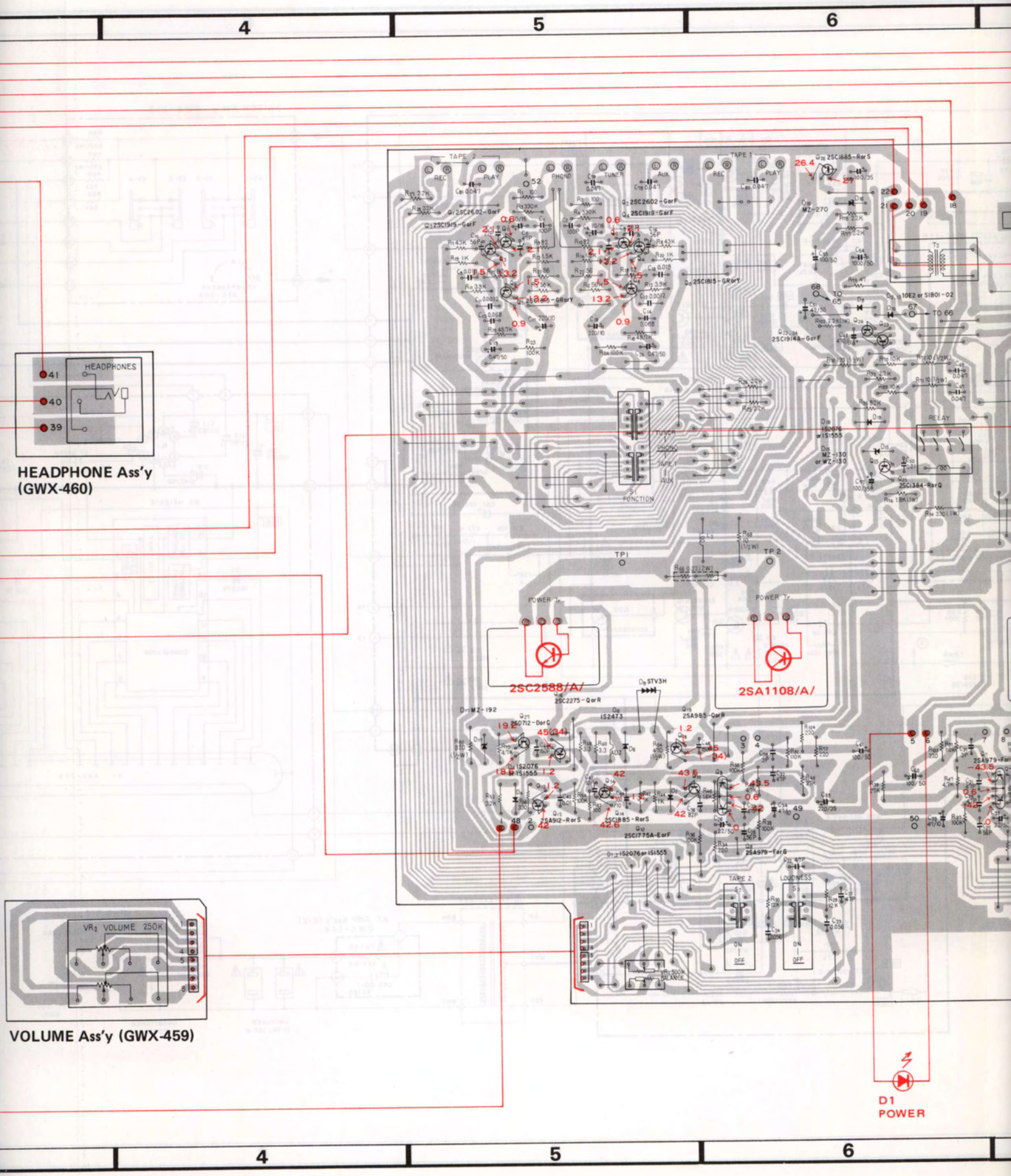
FL Ass'y (AWV-007)

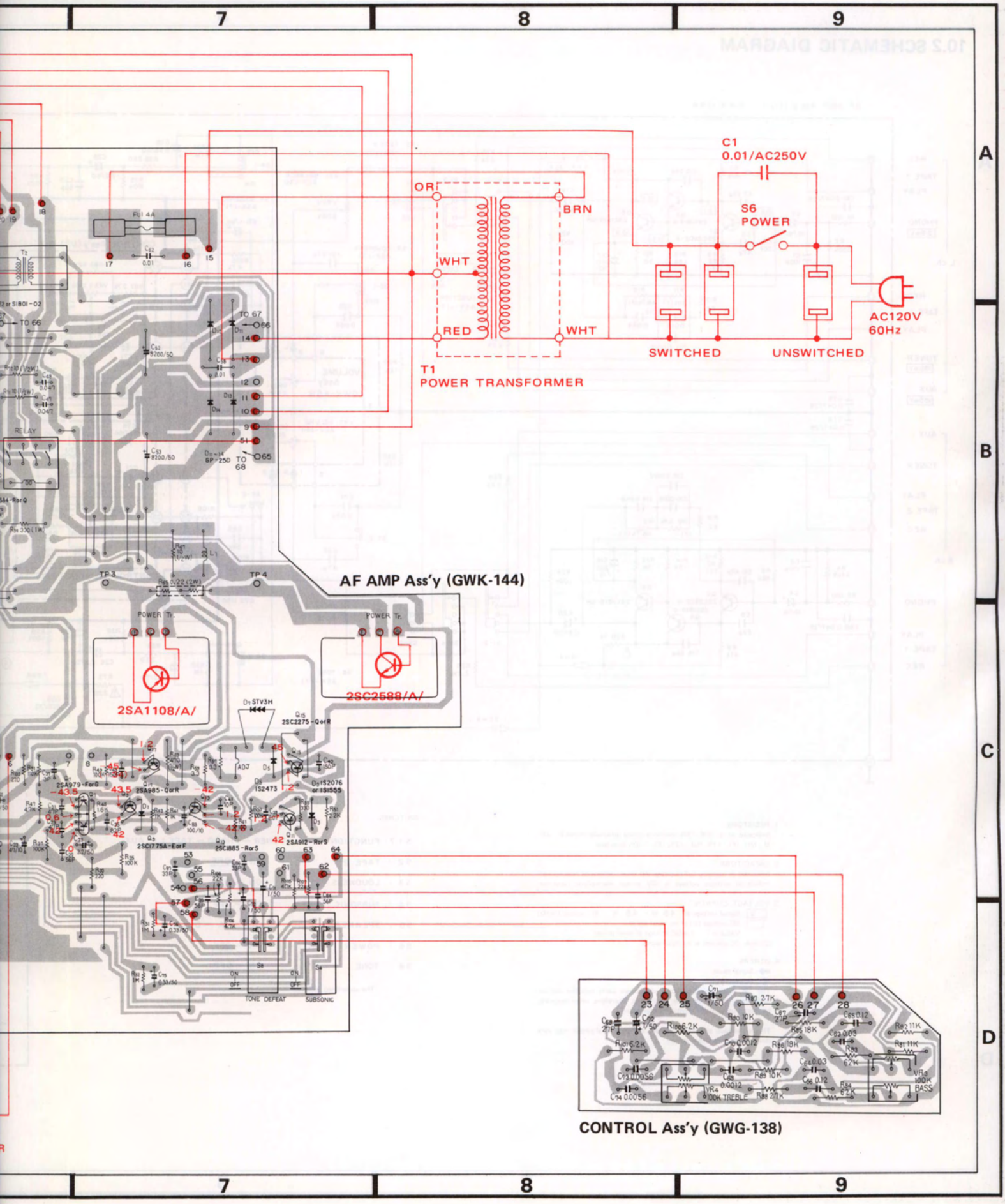
SWITCH Ass'y
(GWS-216)





VOLUME Ass'y (GWX-459


4
5
6
HEADPHONES
41
40
39
HEADPHONE Ass'y
(GWX-460)
VR2 VOLUME 250K
VOLUME Ass'y (GWX-459)
TAPE 2
TAPE 1
PHONO
TUNER
AUX
REC
PLAY
FUNCTION
RELAY
POWER Tr.
2SC2588/A/
2SA1108/A/
TP1
TP2
LOUDNESS
VR1 500K BALANCE
D1
POWER


7
8
9
A
B
C
D
C1
0.01/AC250V
S6
POWER
ORG
BRN
WHT
RED
WHT
T1
POWER TRANSFORMER
SWITCHED
UNSWITCHED
AC120V
60Hz
AF AMP Ass'y (GWK-144)
POWER Tr.
2SA1108/A/
POWER Tr.
2SC2688/A/
TONE DEFEAT
SUBSONIC
CONTROL Ass'y (GWG-138)
TREBLE
BASS

10.4 PARTS LIST OF P.C. BOARD ASSEMBLY

Parts List of Amplifier Assembly (GWK-144)

CAPACITORS

Part No.	Symbol & Description
CCDSL 101J 50	C1, C2
CEA 102M 50L	C54
CEA 221M 35L	C59
CEA 101M 50L	C60, C61, C55
CEA 101M 35L	C56, C77
CEA 101M 10L	C83, C84
CEA 471M 6L	C49
CEA 470M 50L	C51
CEA 221M 10L	C18, C17
CEA 470M 10L	C33, C34
CEANL 010M 50	C71, C72
CEANL 2R2M 50	C25, C26
CEANL 100M 16	C3, C4
CEANL R33M 50	C75, C76
CEANL R74M 50	C19, C20
CCDSL 030C 50	C37, C38
CCDSL 100K 500	C41, C42
CCDSL 220J 50	C7, C8
CCDSL 330J 50	C86, C87
CCDSL 470J 50	C5, C6, C21–22, C29–C32
CCDSL 560J 50	C15, C16, C27, C28, C88, C85
CCDSL 820J 50	C35, C36
CCDSL 151K 500	C43–C46
CKDYF 103Z 50	C50
CKDYF 103Z 500	C39, C40
CQMA 473K 50	C47, C48
CKDYX 473M 25	C78-C81
CQMA 122J 50	C11, C12
CQMA 183J 50	C9, C10
CQMA 563J 50	C23, C24
CQMA 683J 50	C13, C14
ACG-017	C62
ACG-004	C58
ACH-215	C52, C53

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

RESISTORS

Part No.	Symbol & Description
RD¼ PM□□□J	R1–R8, R13, R14, R17, R18, R21–R50, R53, R54, R69, R70, R77–R79, R91–R93, R95, R105–R108
⚠ RD¼ PMF□□□J	R19, R20, R51, R52, R55–R62, R73, R75, R103, R104
RN¼ PQ□□□J	R9–R12, R15, R16
⚠ RD½ PSF□□□J	R63, R64, R76, R80
RD½ PS□□□J	R67, R68, R71, R72
⚠ RS 1P□□□J	R74, R94, R102
⚠ ACN-070	R65, R66

SEMICONDUCTORS

Part No.	Symbol & Description
2SC2602	Q1, Q2
2SC1919	Q3, Q4
2SC1815	Q5, Q6
2SA979	Q7, Q8
2SC1775A	Q9, Q10
2SA912	Q11, Q12
2SC1885	Q13, Q14, Q26
2SC 2275-Q	Q15, Q16 } hfe should have the
2SA 985-Q	Q17, Q18 } same rank
2SC1914A	Q23, Q24
2SC1384	Q25
2SD712	Q27
1S2076 (1S1555)	D1-D4, D18
1S2473	D5, D6
STV3H	D7, D8
10E2 (SIB01-02)	D9, D10
GP-25D	D11-D14
MZ-130 (WZ-130)	D15
MZ-270	D16
MZ-192 (WZ-192)	D17

OTHERS

Part No.	Symbol & Description	
ACT-130	VR1	Variable resistor
ASK-171	S3, S4, S7	Lever switch
ASK-172	S2	Lever switch
ASX-115	S1	Remote slide switch
⚠ ATT-577	T2	Heater transformer
AKB-063	Terminal	
AKB-064	Terminal	
ASR-033	Relay	

Parts List of Tone Control Assembly (GWG-135)

CAPACITORS

Part No.	Symbol & Description
CQMA 303J 50	C63, C64
CQMA 124K 50	C65, C66
CQSA 270K 50	C67, C68
CQMA 122K 50	C69, C70
CQMA 562K 50	C73, C74

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

RESISTORS

Part No.	Symbol & Description
ACT-127	VR3, VR4 Variable resistor
RD¼PM□□□J	R81–R90, R101, R100

Parts List of Switch Assembly (GWS-215)

Part No.	Symbol & Description
ASE-003	S5 Slide rotary switch (SPEAKERS)
RS1P 331J	R96, R97
RD¼PM 563J	R98, R99

Parts List of Switch Assembly (GWS-216)

Part No.	Symbol & Description
ASX-113	S6 Slide rotary switch (FUNCTION)

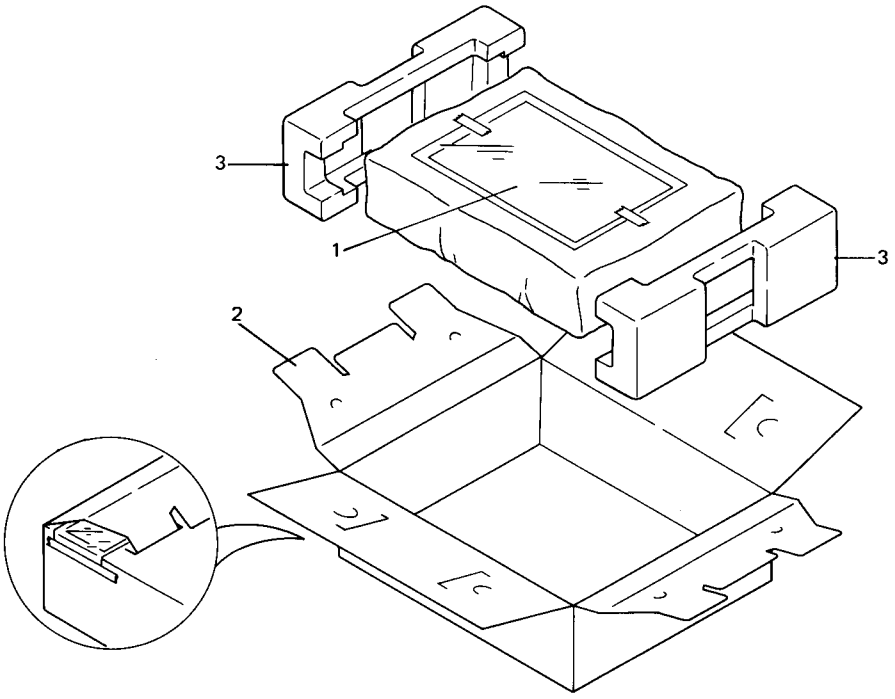
Parts List of Volume Assembly (GWX-459)

Part No.	Symbol & Description
ACV-184	VR2 Variable resistor (VOLUME)

Parts List of Headphones Assembly (GWX-460)

Part No.	Symbol & Description
AKN-023	Headphones jack

11. PACKING



Parts List

Key No.	Part No.	Description
1.	ARB-351	Operating instructions
2.	AHD-754	Packing case
3.	AHA-239	Side pad

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